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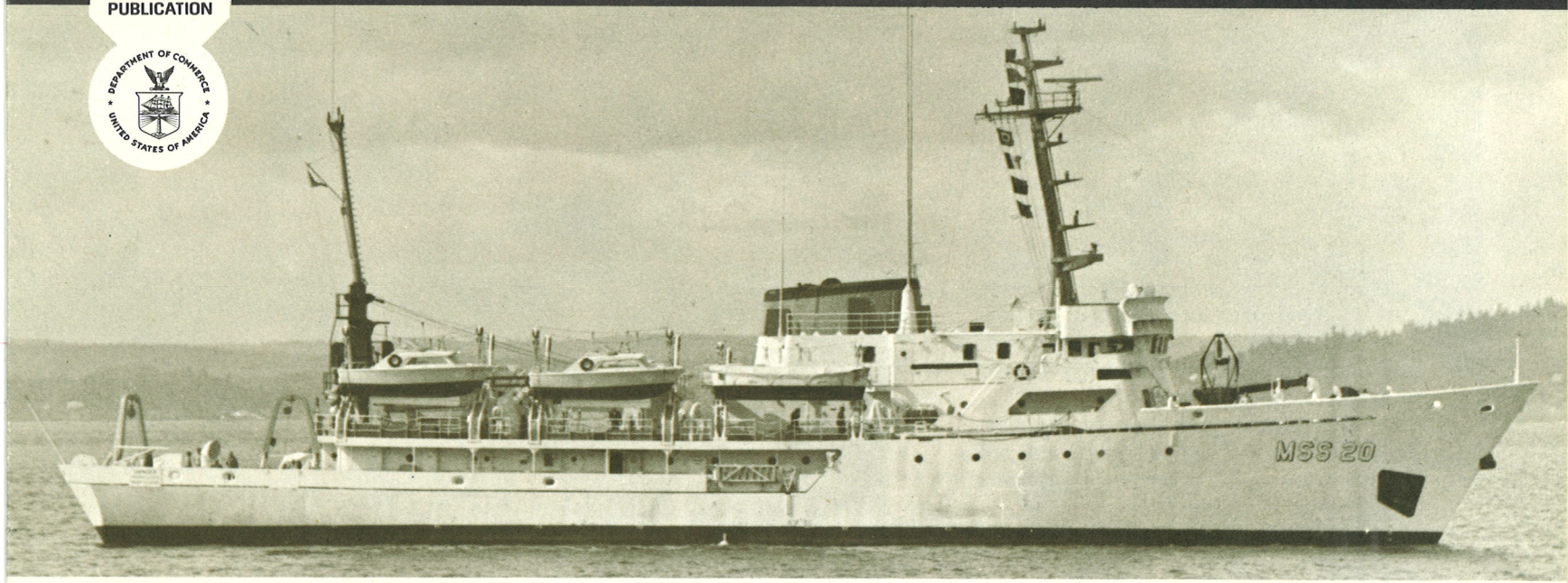
Environmental Science Services Administration

Welcome Aboard!



USC&GSS Fairweather MSS 20

Welcome Aboard!

A message from the Captain:

On behalf of the officers and men of the USC&GSS *Fairweather* I welcome you aboard. I hope your visit will be both enlightening and enjoyable.

Oceanography is one of the fastest-growing and most productive scientific activities in the world today. I hope you will leave our ship with a greater appreciation for, and knowledge of, this science of the seas.

The officers and crew of the *Fairweather* are at your disposal and will gladly answer any questions concerning the ship and her activities.

Sincerely,

Commanding Officer
USC&GSS *Fairweather*

Commanding officer uses ship-to-shore radiotelephone in *Fairweather's* radio room, while chief electronics technician looks on.

The USC&GSS *Fairweather* is one of a fleet of oceanographic survey vessels used by ESSA, the Environmental Science Services Administration, to improve man's understanding and uses of the physical environment. Designated Medium Survey Ship (MSS) 20, the *Fairweather* is operated by the Coast and Geodetic Survey and commanded by officers of the ESSA Commissioned Corps.

The class II survey ship is 231 feet long overall, with a 42-foot beam and a displacement of 1,798 long tons.* The *Fairweather* was designed for hydrographic surveys and some oceanographic operations. Echo-sounding equipment aboard the *Fairweather* can profile ocean depths from shoal water to 36,000 feet, or about seven miles.

The *Fairweather* is equipped with Loran A and Loran A/C receivers, which can be used to determine the ship's position at ranges up to 1,200 miles from shore transmitters. The ship's two surface search radars provide true or relative motion presentations of targets to a range of 60 miles; one is equipped with an automatic track plotter, while the second radar can be used for buoy tracking and surveying.

Other navigation aids include a radio direction finder; an electromagnetic log, which measures ship speed and distance covered; a forward- and side-scanning sonar system; and a gyro compass and gyro pilot system. There are extensive communications facilities, for use on medium and very high frequency radio bands.

During survey operations the ship's position at sea can be established to a high degree of accuracy with the electronic positioning system, which is capable of continuously monitoring the ship's location to an accuracy of 100 feet at ranges up to 150 miles. A single side-band transceiver and a 2-kw portable diesel generator are supplied with each shore station.

The *Fairweather* carries three 25-foot survey launches, all equipped with depth-recording and electronic positioning systems for precise inshore survey operations, a 26-foot motor whaleboat, and a 24-foot motor lifeboat. A 28-foot landing craft type boat is used to ferry equipment and supplies ashore—it takes both ship and shore parties to conduct a hydrographic survey. The ship can also handle the buoys, meters, and telemetry needed to make systematic current measurements.

The ship's oceanographic capability includes track-line depth and magnetic field, surface and upper-air meteorological observations, and bathythermographic measurements down to 2,700 feet. Her on-station capability includes Nansen bottle water sampling, bottom dredging, sediment grab and core sampling, tidal measurements, and various laboratory activities. Special equipment which can be used by the ship includes the seismic reflection profiler, which shows subbottom geologic structure; a gravity meter that is lowered to the ocean floor to measure the strength and direction of the earth's gravity field; the thermoprobe, which measures heat flow from the earth's crust into the lower levels of the ocean; and various sea-air interaction sensors.

The primary mission of the *Fairweather* is coastal hydrographic surveys, gathering information on shoreline, depths, and currents for the Coast and Geodetic Survey's nautical chart series. The ship's hydrographic work also contributes to a new series of bathymetric maps showing detailed relief of the Continental Shelf. She has also proved to be a very useful platform for marine environmental research.

The *Fairweather* has a range of 8,000 nautical miles and a maximum speed of 14.5 knots, and can be provisioned for 24-day periods at sea. Her

* In the same generation of survey ship, the class I USC&GSS *Oceanographer* and *Discoverer* are 303 feet long, with a 52-foot beam, and displace 3,885 long tons; the class III USC&GSS *McArthur* and *Davidson* are 175 feet long, with a 38-foot beam, and displace 995 long tons.

ice-strengthened hull permits operations in floe ice, and she is fully air-conditioned for crew comfort and efficiency in warmer latitudes. Diesel engines delivering 1,200 shp each to the twin, controllable-pitch screws provide ship propulsion. A 200-bhp diesel engine drives a tunnel bow thruster that delivers 5,000 pounds of thrust to either port or starboard, greatly improving the low-speed maneuverability and station-keeping qualities of the ship. The *Fairweather* carries four winches. Two are bathythermograph winches. Another is a double-drum oceanographic winch; one drum has 30,000 feet of 3/16-inch cable, the other has 12,000 feet of 5/16-inch electrical cable. The fourth is a dredge and trawl winch equipped with 600 feet of 3/8-inch cable.

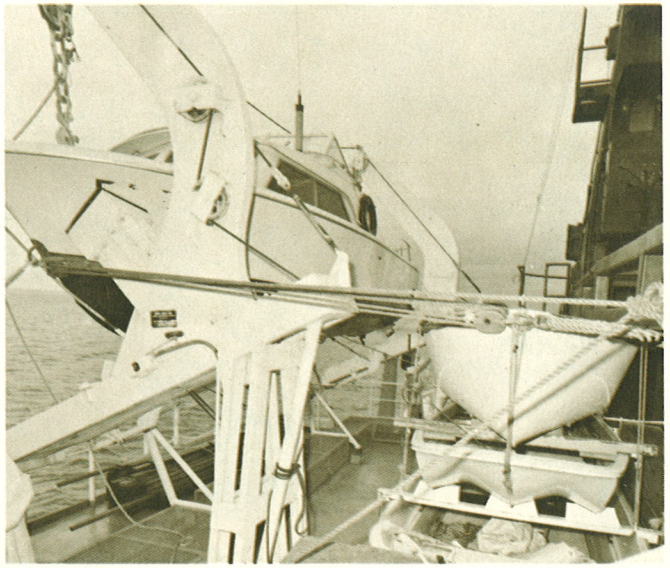
Like other survey ships in her generation, the *Fairweather* is heavily automated. One man can monitor and control the machinery and the ship from the pilot house bridge and after control station as well as from the centralized engine room control station. Logging of all main and auxiliary engine parameters, including a bell logger, is accomplished automatically.

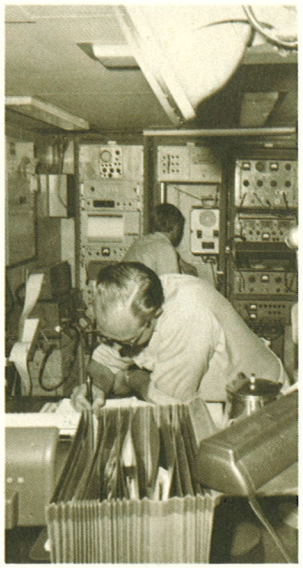
The USC&GSS *Fairweather* is one of three class II ships of similar design. The sister ships are the USC&GSS *Rainier* (MSS 21) and USC&GSS *Mt Mitchell* (MSS 22). These $4.3 million survey vessels were designed by the U.S. Maritime Administration to Coast and Geodetic Survey requirements, and built by Aerojet-General Shipyards, Jacksonville, Florida. The *Fairweather's* keel was laid November 30, 1965. The ship was christened March 15, 1967, and commissioned October 2, 1968. Her home port is the Coast and Geodetic Survey's Pacific Marine Center, Seattle, Washington, with the *Rainier*. The *Mt Mitchell* is based at the Atlantic Marine Center, Norfolk, Virginia.

Class II survey ships are customarily named for some prominent physical feature in the ship's operating area. In the case of USC&GSS *Fairweather,* the namesake is 15,300-foot Mt. Fairweather, an impressive feature on the mountainous northern border between Alaska and British Columbia, in Glacier National Monument. Called Tanaku by the region's Indians, Mt. Fairweather was named by Captain James Cook in 1778, presumably for the good weather at the time of his visit.

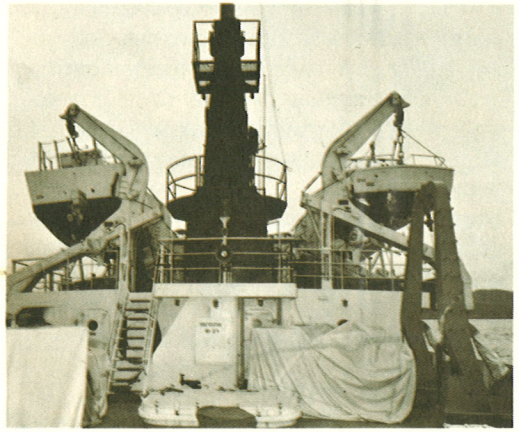
General Description

Length, overall	231 feet
Length, waterline	207 feet
Beam, molded	42 feet
Draft, mean full load	13 feet, 10¼ inches
Draft mean light ship	11 feet
Displacement (mean full load)	1,798 long tons
Maximum speed	14.5 knots
Range	8,000 nautical miles
Endurance	24 days
Complement	79

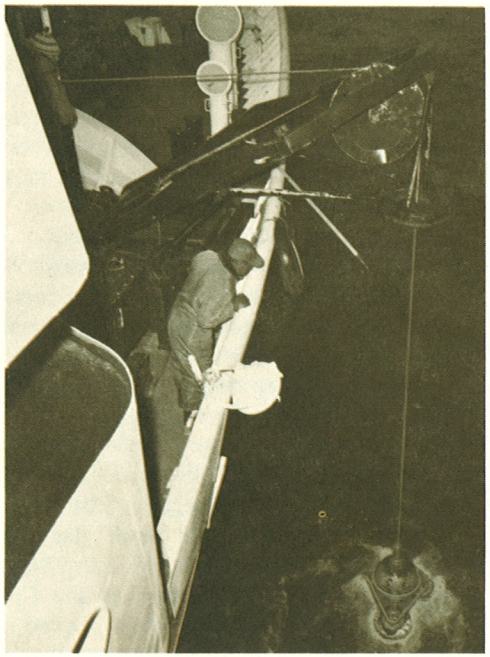




Above: One of three 25-foot survey launches used in precise inshore survey operations. Note the deck-stored equipment lashed down for sea.
Above right: In the *Fairweather's* plotting room, a chief survey technician computes gravity data. Consoles for the position-fixing system are shown in background.
Right: The ship's oceanographic crane and two auxiliary boats are shown in this view looking forward from extreme after end of deck.



Oceanography at ESSA



A gravity meter is retrieved from a precisely positioned station on the ocean floor. Obtaining sea-bottom gravity measurements along the Continental Shelf is part of the descriptive work which must be done before man taps these new reserves.

The Coast and Geodetic Survey and the Atlantic and Pacific Oceanographic Laboratories are the principal oceanographic elements of ESSA. The interplay between the two is readily apparent. The Coast and Geodetic Survey's systematic ocean surveys produce oceanographic, geophysical, and geological data of interest to the Laboratories' programs; and the improved understanding of the marine environment developed from research has its impact on the conduct of systematic surveys.

The data-collection platforms behind ESSA's marine description and prediction programs are the ships of the Coast and Geodetic Survey fleet, ranging in size from the *Oceanographer* and *Discoverer,* down to the small pair of wire-drag specialists, *Rude* and *Heck*.

The Atlantic Oceanographic and Meteorological Laboratories are headquartered in Miami, Florida, and include the Atlantic Oceanographic Laboratories and the National Hurricane Research Laboratory. The Pacific Oceanographic Laboratories at Seattle, Washington, include small, specialized research groups such as the Joint Tsunami Research Effort, at the University of Hawaii, and the Joint Oceanographic Research Group, at the University of Washington. The objective here has been to foster productive environmental research, both as a federal sponsor and as a member of the academic community.

The USC&GSS *Fairweather* is important to both the service and research aspects of ESSA's oceanographic program. The ship's hydrographic surveys improve the safety of coastal commerce, harbor operations, and recreational craft. Her part in developing detailed bathymetry of the Continental Shelf regions will help man tap these undersea reserves. Her performance as a research platform will hasten an improved understanding of the physical environment.

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